Analysis of OLTP Service Vendors

for

Digital Equipment Corporation

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INPUT®

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1.0 Purpose

The purpose of the project was to assist Digital Equipment Corporation in assessing the OLTP (On-Line Transaction Processing) competitive environment by preparing profiles of approximately thirteen US and European companies.

2.0 Background and Objectives

Digital Equipment Corporation has launched a corporate project to examine the OLTP markets and DEC's related business strategy. The first of the four research phases that have been identified is focused on the OLTP competitive environment.

As part of the first phase, DEC has identified a need to obtain profiles of thirteen US and European "strategic competitors" in OLTP services. DEC has asked INPUT to prepare profiles of the companies.

To meet DEC's requirements, INPUT has prepared profiles to meet the following objectives.

A. Identify the company's strategies, resources, organizations, products, services, and alliances that are unique to OLTP.

B. Describe the company's OLTP-related services as part of the application development life cycle, including the following:

- Systems design
- Planning
- Implementation
- Operation

C. Identify the company's capability and strategy to deliver remedial OLTP services such as the following:

- Special hardware design features (hardware vendors only)
- Remote service strategies
- Update procedures for distributed applications
- Call handling and excalation features
- Customer role

D. Analyze the company's marketing strategy for positioning, packaging, pricing, and delivering OLTP products and services.

E. Identify the company's programs for supporting third-party OLTP software developers and support for customer-developed OLTP applications.

F. Identify "user perceptions" such as:

- Why the company is considered successful by its customers
- The company's strengths and weaknesses
- Services necessary to successfully penetrate the OLTP market.

3.0 Project Scope and Methodology

The scope of the project included a thorough review of research material, the development of a comprehensive interview outline to be used as a guideline for interviews with each of the companies, and comprehensive interviews with product representatives in each of the companies.

4.0 Project Summary

Using a broad definition of OLTP, all of the hardware companies believe that they are in the OLTP business. In contrast, the majority of the software and professional services companies do not. Professional service companies indicated that they generally do not pursue an OLTP as a specific market opportunity, but implement OLTP if it appears to be the best solution.

The majority of the hardware companies do not generally provide applications or custom development support. They do provide consulting and have alliances with software companies. The software and professional service companies provide an extensive variety of custom design and implementation services.

The extent of alliances varies considerably, as does the degree of formality. Most have some form of alliance with one or more company, but some alliances can be less formal.

As examples of more-formal relationships, Tandem has alliances with 260 software companies and other third parties. Stratus has OEM agreements with IBM and Olivetti and alliances with 150 software companies. Cullinet has alliances with a few companies to provide interfaces for the manufacturing environment.

A key focus of support from the hardware companies is high equipment reliability and remote maintenance. The ability to provide on-line diagnosis is becoming increasingly popular.

Few of the companies provide support for third-party or customer-developed software. Professional service companies are more inclined to accept such responsibilities and Arthur Andersen has an extensive staff to assist in maintaining other software. None of the companies were identified as providing any significant support for ongoing operations.

All of the companies have formalized support groups. However, there is little organized support for OLTP outside the normal support activities. Since the majority of the companies found it difficult to distinguish OLTP from their primary business, they believed that their support groups are providing OLTP support.

Support pricing varies by company. For software companies, support for the first year is frequently bundled into the price of the product. For other companies, support costs are generally from a standardized schedule or related to a specifically negotiated contract.

The most frequently mentioned competitors included the major accounting firms, specifically Arthur Andersen, Tandem, Stratus, IBM, EDS, and Computer Task Group. However, even though these were identified, many of those interviewed believe that they are relatively secure in their area of specialty.

All of the firms included in the survey believe that OLTP services are essential to current business needs and that these services will become increasingly important in the future.

5.0 Company Profiles

Chapter five of the report provides profiles of the support services of approximately twenty-six companies identified by DEC as potential strategic competitors in the field of On-Line Transaction Processing.

Each of the profiles provides a brief summary of the company and its products, followed by a description of services provided to support OLTP products.

Arthur Andersen

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Company Overview

A part of the Arthur Andersen worldwide organization, Andersen Consulting provides professional services in accounting, audit, tax, professional education, and management information consulting to clients through 231 offices in 49 countries.

The Consulting group assists in planning, designing, and installing computer-based information systems of all types and sizes for clients in almost every professional, business, and government sector.

Andersen Consulting provides services in systems design, installation, systems integration, systems productivity consulting, information planning, strategic consulting, change management, and facility/network management.

In addition to these consulting services, the company also offers application software products that support manufacturing resource planning/control and distribution control/warehouse management. Andersen markets and supports the FOUNDATION™ computer-aided software engineering software product.

Andersen Consulting's fiscal 1988 revenue reached $1.1 billion, a 32% increase over fiscal 1987. This revenue represents approximately 40% of the total revenue ($2.82 billion) for the company.

Of the total consulting revenue, approximately 55% was derived from professional services, 40% from systems integration, 3% from application software products, and 2% from systems software products. Professional services include software development (70%), consulting (15%), and education and training (15%).

OLTP Support Services

Andersen Consulting believes that the majority of its consulting practice is focused on On-Line Transaction Processing. As a result, the company has neither a specific OLTP group nor an OLTP strategy. The OLTP group is the consulting practice and the strategy is the strategy of the consulting company.

Andersen divides systems into three basic types: batch, query, and OLTP. The company indicates that query is a necessary by-product of data base systems and goes hand-in-hand with OLTP systems. The company sees batch systems as extremely minimal and does little work in that area. Andersen estimates that nearly two-thirds of its staff of 14,000 is dedicated to OLTP.

Andersen is organized by office, with technology centers located strategically throughout the country. Within the overall practice, there are groups that focus on

areas of specialty (i.e., Tandem, DEC, MSA, McCormack and Dodge, AI, etc.). The majority of the technology centers are located at the headquarters location; however, some are located in other offices.

In addition to these technology/product groups, there are groups that specialize in the industries from which Andersen draws the majority of its revenue: Manufacturing (22%), Consumer Products (19%), Federal Government (14%), and Banking (14%).

Andersen provides comprehensive consulting assistance at all levels of the application development life cycle. It has a basic strategy of developing applications in conjunction with a client, working with the client to understand the application, and turning the application over to the client.

For applications developed by Andersen or for applications that Andersen has agreed to support, telephone support is available, but the support is limited. The majority of Andersen's support is provided at the customer's site.

Escalation of problems is at the discretion of the analyst handling a problem. An on-site analyst works with a customer to identify a problem and escalates the problem only if unable to resolve it in a "reasonable" time. Determination of a reasonable time is done in conjunction with the assignment manager.

Andersen supports a wide variety of software, irrespective of origin. This includes customer-developed software, third-party software, and locally developed software. Support for these products is provided by the Application Software Group and is provided at the same level and in the same form as support for products developed by Andersen Consulting.

Andersen has no specific price schedule for support services. Prices can be fixed-rate, time and material, or for a specific product. Generally, prices are negotiated with the customer and are highly dependent on the work to be accomplished.

OLTP Support Strategy

Andersen's fundamental strategy is to be able to provide all systems services—from strategic planning to equipment operation—to all organizations.

With one of the largest information services practices in the world, Andersen's business has evolved from a recognition that, as organizations and systems became more complex, there will be an increasing need for professional services support.

Andersen believes that it has few competitors, but that this will change as more large organizations such as DEC and IBM strengthen their positions in professional services.

IBM is seen as being in the strongest position to become a strong competitor. DEC is generally viewed as having excellent capabilities, but not able to capitalize on them. Overall, Andersen believes it has built such a strong, broad base that there will be few serious competitors in the strongest market areas (manufacturing, consumer products, federal, and banking).

Andersen believes that the best support results from working directly with the client. This generally means that an Andersen representative, knowledgeable with the customer's business and applications, is available locally, at any time, to address the client's need or problem.

Physical presence and a broad range of technical capabilities form the basis for Andersen Consulting's strengths. In addition, Andersen has established relationships within the executive offices of most of its accounts. This results in Andersen being viewed as the vendor of preference in many cases.

The chief weakness of Andersen is cost. Although the cost for lower-level technical support (analysis, programming, etc.) is not significantly different than for other companies; the added costs of account managers and partners make overall costs considerably higher. In addition, although a product-oriented company can build support into the overall cost of the product, the costs of a professional services organization are highly visible. The high cost places high emphasis on project success.

Andersen believes that, to be successful, an organization must be able to respond to all customer requests—from the smallest (a single program) to the largest (systems integration).

To ensure success, Andersen has both extensive company expertise and numerous formal and informal alliances. Andersen maintains alliances with all hardware manufacturers and software providers.

Andersen Consulting is expected to remain a dominant player in the field of OLTP.

Arthur Young

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Company Overview

Arthur Young, one of the Big Eight accounting firms, provides accounting and auditing, tax advisory services, management consulting, and entrepreneurial services to a broad range of industries, including banking, insurance, health care, retail distribution, manufacturing, oil and gas, entertainment, and real estate.

The company provides software development and other information services in areas such as office automation, inventory tracking and reporting, voice and data communications, and telecommunications.

Arthur Young has offices in 93 U.S. cities. Overseas, Arthur Young International has more than 350 offices in over 70 countries. The company has 700 to 800 technical management consultants working out of its many offices.

OLTP Support

The Information Technology Group (ITG), part of Arthur Young's Management Consulting Group, offers two types of services: First, it provides information resource management-related consulting in areas such as strategic information systems planning, information engineering methodology development, and technology management. Second, it provides consulting in the planning, management, design, and implementation of large, complex application systems.

Arthur Young claims that it is an industry-driven and market-driven company, and because it is not a hardware manufacturer, it does not pursue the OLTP market as such. Arthur Young consultants have designed and implemented OLTP systems when OLTP provided the best solution for the client's business situation. They have also provided many other types of information systems.

Arthur Young said that ITG consultants try to understand the needs of a client's business first, and then focus on the creation of "mission-critical" systems. The company helps to plan, design, and implement strategically sound systems that make information technology a competitive weapon for general and financial operations, marketing, customer service, product development, distribution, and human resources management.

Arthur Young assigns one of its professionals as the contact person for each project. This professional is responsible for establishing a relationship with the client company. In the case of smaller companies, the professional may be the one

resource required. For larger companies, this individual may lead a team of Arthur Young professionals.

Arthur Young is rarely involved in systems operation activities. However, after a system is implemented, the company is generally kept on retainer for three to six months to provide support services. If there is a problem, the project manager, also known as the engagement partner, is contacted by the client company.

Arthur Young does not provide support for third-party software nor does it provide support for customer-developed software, unless the customer developed the software along with the Arthur Young team. The company does not have any remote-support capabilities.

OLTP Support Strategy

Arthur Young has no real OLTP support strategy. The company described its strategy in the OLTP market as reactionary, at best. Providing OLTP systems originated from the need to serve companies in industries such as banking and brokerage services. The company defines its strategy in the information technology arena as providing knowledge and direction to ensure the effective and efficient use of information technology at all levels. The company's goal is to emphasize the development of application systems that support a client company's strategic vision.

Arthur Young reported that it does not have any strategic alliances in the OLTP market. However, the Information Technology Group has formed strategic alliances with Harvard University on a major study entitled, "Strategic Computing in the Public Sector" and with the MIT Sloan School on its "Management in the 1990s" program. The studies focus on the impact of technology on American business and government in the years ahead.

In addition, Arthur Young has entered into a strategic alliance with KnowledgeWare, Inc. and James Martin, a writer and spokesman in the world of information technology. Together, they are developing Arthur Young's Information Engineering Workbench, a set of automated productivity tools, which will enable the company's systems professionals to develop and implement automated systems more cost-effectively and more quickly than by traditional methods.

Arthur Young reported using Tandem, Stratus, and IBM equipment for OLTP systems. The company considers its competitors in the OLTP consulting field to include the major OLTP hardware vendors and Arthur Andersen.

Arthur Young claims that its track record and reputation for quality service have made the company a leader in information solutions, and considers technical expertise to be essential in providing OLTP support services.

Cullinet Software, Inc.

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Company Overview

Cullinet Software, Inc., a major software vendor, provides data base and tools software for IBM mainframes and the DEC VAX line of computers, in addition to applications for vertical markets, including the manufacturing and financial industry sectors.

In January 1988, Cullinet began shipping IDMS/R Release 10.2, which combines Structured Query Language (SQL)-based data retrieval with multiprocessor support and a high-performance data base engine. Cullinet's SQL-based data base management system is designed to provide the ease-of-use features of relational technology, plus the performance features essential for transaction-intensive (OLTP) environments.

In April 1988, Cullinet delivered new releases of its manufacturing and financial application software, featuring over 700 functional enhancements; accompanying software implementation aids; and new releases of GOLDENGATE and INFOGATE, its software offerings for personal computers. These releases are germane to Cullinet's strategy of providing integrated software solutions for demanding business environments.

Revenue for fiscal year ended April 30, 1988 was $216.7 million, which represented approximately 24% growth over the previous year. However, the company sustained losses during fiscal 1987 and 1988.

In May 1988, Cullinet announced a major restructuring, which entailed consolidation by product line of all development, education, documentation, and quality assurance and consolidation of all sales, services, technical support, and marketing activities. In addition, the company reorganized its account executives to focus on vertical industries that are more closely matched with Cullinet product strengths. Also in May, the company reduced its workforce by 400 employees (16%). These changes enabled Cullinet to reduce operating expenses during fiscal 1989.

In addition, Cullinet divested Planning Control International and Computer Strategies, Inc. during the past year, reportedly in an effort to focus on core products and strategic areas that the company considers critical to its long-term growth.

OLTP Support

Cullinet provides full support of all its software products through software updates, a 24-hour telephone support line, and an on-line Technical Support Information System (TSIS). One feature of TSIS is that customers can access an on-line data base to browse for solutions to problems. In rare instances, Cullinet also sends special teams on-site to handle problems.

Cullinet also provides OLTP support in the form of application design, planning, and implementation for customers developing their own OLTP applications. This type of support is provided mostly to Cullinet's manufacturing customers. The company also offers project management support services, in which the project manager generally works with a customer team to monitor the application development and implementation schedule. Cullinet does not, however, get involved with systems operation activities.

Cullinet's support services are provided as part of the license or renewal fee within a certain timeframe, after which support is billable. The fee for application development and other OLTP support services is either negotiated on a contract basis or billed on a time-and-materials basis.

Cullinet does not provide support for third-party software nor does it provide support for customer-developed software, unless the software was developed jointly by the customer and Cullinet.

Support is handled through Cullinet's Extended Support Division. Although the division was not established specifically to support OLTP applications, Cullinet reports that, for the most part, support is provided for OLTP applications. Cullinet reports a high level of satisfaction among its customers as a result of continued investments in quality assurance, service, and support.

OLTP Support Strategy

Cullinet's OLTP support services are offered as an extension of the company's OLTP software products. The company began offering OLTP support services in response to requests from customers, particularly customers of its data base management systems and manufacturing software products.

Cullinet has established alliances, called CIM strategic marketing agreements, with other vendors providing interfaces to Cullinet's MRP (manufacturing) system. Cullinet currently has agreements with the following companies: Cadam, Inc., which provides a CAD/CAM interface; Epic Data, Inc., which provides data collection hardware, such as scanners and code readers; and John A. Keane Associates, which provides a quality-control monitoring system.

Cullinet considers expertise in OLTP, as well as familiarity with the software products and the hardware environment utilized, to be essential to providing good

OLTP support. The reason is that, from a performance standpoint, expectation levels are high for those running OLTP applications.

Company Strengths and Weaknesses

Cullinet considers its primary competitors in the OLTP arena to be the Big Eight accounting firms and Computer Task Group. The strength of these companies lies in their size. With greater financial resources and more employees, these companies have a greater capacity to handle OLTP support services.

Cullinet's strengths include its depth of knowledge and experience with data base management systems, in addition to manufacturing and financial applications.

Ernst & Whinney

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Company Overview

Ernst & Whinney, one of the Big Eight accounting firms, is an international consulting, accounting, and tax advisory firm. The majority of Ernst & Whinney's clients operate in the manufacturing industry, although the company also provides services to many other industries.

Ernst & Whinney reports providing management consulting services to over 2,500 businesses and organizations each year. Consulting assignments range from advising management on broad objectives to providing detailed technical aid on projects.

In addition to consulting services, Ernst & Whinney provides several application software products. These products include tax planning software, as well as industry-specific application software products sold to the banking, health care, insurance, and oil and gas industries.

OLTP Support

Ernst & Whinney does not have a separate OLTP consulting or support group established. Instead, OLTP consulting and support is handled as part of the company's overall consulting services. The company has approximately 1100 information systems consultants in all. Some of these consultants operate from regional offices and specialize in particular vertical markets. Others are part of the company's Advanced Technology Group and have a more-horizontal technical orientation.

Teams are formed with consultants from both the regional offices and the Advanced Technology Group. These teams are headed by a partner, who has the authority to make all decisions affecting that client and has the support of all the firm's resources to serve that client. Ernst & Whinney believes that this decentralized approach translates into responsive, high-quality service to clients.

Ernst & Whinney provides application development consulting services for OLTP and other applications—from the application design and planning phases through the implementation phase. The team is involved with analyzing the client's business, identifying client needs, and developing the system, including its on-line components, software package modifications, hardware and operating environment selection, and network design.

The client's part in the support process is to actively participate in the system development process with the team; Ernst & Whinney provides the industry and technology expertise. The client is also responsible for systems operation activities.

Ernst & Whinney does not provide any ongoing support in the form of telephone hotline support, remote support, hardware support, or systems operation for it clients. If a problem occurs, the client contacts the partner responsible for the project for any support services.

Ernst & Whinney provides software updates for its own software and for third-party software that it installs. The company also tailors software products to meet custom requirements and assists customers in migrating from one application to another or from one version to another. However, Ernst & Whinney seldom provides support for software developed by its clients and then only if retained by the client to do so.

Support is provided on a contract basis, either fixed price or time and materials.

OLTP Support Strategy

Ernst & Whinney's philosophy and operating objective is to make available to all clients the full benefits of its professional capabilities--to meet their needs, to help them take advantage of business opportunities, and to help solve their problems.

The Ernst & Whinney OLTP support strategy is part of its broader strategy of providing business solutions versus providing information systems or even OLTP applications. If OLTP applications are part of the solution, Ernst & Whinney will provide the applications and support them.

Offering OLTP support stemmed from the company's commitment to support information systems overall. Since beginning work in the area of OLTP, Ernst & Whinney has found it more important to hire consultants familiar with certain aspects of OLTP.

In June 1988, Ernst & Whinney announced the acquisition of Network Strategies Inc., a consulting firm specializing in network integration. The acquisition was made in an effort to strengthen Ernst & Whinney's network design, implementation, and management capabilities. The company expects the demand for network integration services to boom, as many corporations downsize and decentralize their operations.

Ernst & Whinney has stated that the development of strategies for network management is a critical component of the information services that it provides to its clients.

Ernst & Whinney named Arthur Andersen, the other Big Eight accounting firms, and Electronic Data Systems as its primary competitors.

Groupe Bull

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Company Overview

Bull is the second largest European-owned information systems and service supplier, second only to Siemens. Group revenue for 1988 was $5.3 billion, of which some 64% came from the European market.

Bull's structure has been changing recently. In March 1987, the agreement was signed to form Honeywell Bull Inc., jointly owned by Groupe Bull (42.5%), Honeywell (42.5%), and NEC (15%). In January 1989, the name of the group was changed to Bull HN Information Systems Inc. to reflect the increased shareholding by Groupe Bull (to 64.1%) and the corresponding decrease by Honeywell (to 19.9%).

Today, Groupe Bull consists of two operating companies: Bull S.A., headquartered in Paris, France; and Bull HN Information Systems, headquartered in Billerica, MA, U.S.A.

Bull has been at the forefront of European Open Systems network development. It has committed itself to implement ISO/OSI standards. It is placing specific emphasis on UNIX and was the founding member of the X/Open Group. It is also a member of the Open Software Foundation.

In November 1988, Bull launched its new top-end mainframe, the DPS 9000 system. This is the first major product to be produced by all three partners and its first management system to pass the 1000-transactions-per-second barrier.

OLTP Support Services

Bull views all its mainframe hardware as potential OLTP platforms, from the new DPS 9000 series down through the DPS 8000 and 7000 series, to the low end of the mainframe range.

Although Bull does not have a specific group as such to deal with OLTP support services, it does have a group within the "Mission Mondiale" that looks after OLTP. Its service is broken into:

- Proprietary systems
- Unix
- National markets

Bull was unable to quantify the number of people working within this group.

Bull provides OLTP software updates. Its remote support structure consists of centers that are functioning 24 hours a day, 7 days a week. However, these centers and support are chronically underused because end-user problems are few.

Call handling and escalation procedures are set up to provide immediate help, backups are in place, and the maximum time that is allowed for a system to be down is four hours. This is a worldwide strategy.

The customer has no role to play in OLTP support. However, there are cases where the customer will be involved in the optimization of application, either in tandem with Bull or via a third party.

As far as application development, Bull's system engineers use their ISI methodology and various tools for testing. Bull's "Centres de Competence Reseaux" will simulate real-life situations prior to installation. Many third parties have developed CASE tools (Arthur Andersen's Foundation, CGI's Backbase) for Bull, and Bull will also develop products for specific clients. Bull system engineers will fully support implementation and operation.

With regard to software support, Bull stressed that each customer will enter into a "marketing agreement" that will lay out the level of service, accountability, etc. of each party. For customer-developed software, Bull system engineers will provide support. If it is third-party software, then the third party would be expected to provide the support. If locally developed, Bull systems engineers would provide the service.

OLTP Support Strategy

Bull's OLTP support services are totally "unbundled." This means that they are structured by country, by hardware, by level of service required, by level of security required, by data base requirements, etc.

These services are compiled on a contract basis. Bull's strategy is controlled by a central committee that packages and delivers the services under the umbrella of "Advanced Technology." This does not just include OLTP, but also security, networking, artificial intelligence, and data bases.

Bull's reason for offering OLTP support services is that a) the demand is there, b) Bull is not stepping on any of its partners' toes, and c) Bull believes it is best placed to offer such services.

Bull has positioned itself very much as a large company with a high-quality product that has been available in the market for a long time.

With regard to strategic alliances, OLTP is very much a proprietary offering from Bull.

With regard to pricing, the 4 DPS 9000 models range from 41 million French francs ($6.5 million) for the monoprocessor, to 151 million French francs ($24 million) for the quadriprocessor (minimal configuration).

Bull believes that its major competitor is Tandem, whose strength lies in the fact that OLTP fits in very much with Tandem's image and is therefore regarded to be a speciality.

Bull believe that in OLTP the two key issues are the architecture, which enables you to position yourself correctly, and the operating system. If you get both right, "you've cracked it."

Hewlett-Packard

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Company Overview

Founded in 1939, Hewlett-Packard is a leading provider of electronic computing and measurement systems. As of the end of 1988, the company had net revenues of $9.8 billion, an increase of 22% over the previous year. In the same year, the company had net earnings of $816 million, an increase of 27% over the previous year.

With offices throughout the world, HP employed 87,000 people as of the end of 1988. Approximately 30% of total revenues is derived from information systems and services.

OLTP Support Services

HP develops and markets a range of information service products, including the HP 3000. HP believes that the HP 3000 is the company's primary product for the OLTP market, but indicates that the term OLTP is only a new buzzword for products and services HP has been providing for a number of years.

HP believes that features such as block mode transfer, large memories, cache memory, and fiber link I/O identify the 3000 series equipment as a leader in the OLTP marketplace.

To meet the needs of support for OLTP, HP established a separate operating group in late 1988. The group, Worldwide Customer Support Operations, provides direct product support and support for marketing.

Although HP was not able to specifically identify the number of individuals in the group, the number is in the thousands. Individuals in the group are generally divided into three categories—hardware engineering, software engineering, and marketing support.

The support operations group is organized as a separate operating entity with full profit and loss responsibility, but individuals are physically located in sales offices and support centers throughout the world.

Remote support is provided for both hardware and software. For hardware, HP provides remote diagnosis. For software, HP provides software updates and an on-line capability to analyze the operation of a customer's software.

Problem diagnosis and escalation is accomplished according to a predefined set of standards. The company's normal response time is two hours; however, this time can be reduced to an hour or less for sites that are defined as critical.

Problems are escalated according to a predefined schedule that relates to the specific product. When a problem is not resolved according to a predefined standard, it is automatically escalated to the next level. There are an estimated four to five levels of escalation.

The customer is involved in the early part of the problem identification process. HP provides a predefined set of steps that the customer is asked to follow to eliminate or reduce the possibility that the problem is a customer error.

HP provides little to assist customers with the application design, planning, or implementation process. HP does not have standard offerings; however, the company will provide assistance on a consulting or time-and-materials basis if asked by the customer. Assistance is provided for operations through HP's standard application support agreement.

Generally, HP does not provide support for third-party, customer-developed, or locally developed OLTP software. HP does provide limited support for diagnostic tools provided by Adager and for some PC software. HP will respond to a unique request, but does not provide this support as a standard offering.

HP's OLTP support services are provided according to a standard price list. There is no bundling and work is generally fixed price.

As a general strategy, HP provides a menu of support options from which a customer can select those that meet the customer's needs. In addition, HP will respond to a specific request, but generally tries to fill requirements from a standard offering.

OLTP Support Strategy

A key indication of HP's interest in customer (OLTP) support services is reflected in a recent statement by HP corporate staff in early 1989:

"Worldwide customer support business remains an attractive and profitable activity. Last year we initiated a program in which we would contract to diagnose and manage customer networks that include products from selected other vendors. This new support program received enthusiastic customer response."

HP indicates that it has not made any conscious decision to begin offering support services. The company believes that OLTP is merely a new descriptive term for services that HP has been providing for at least the past fifteen years.

HP believes that OLTP support is a partnership arrangement between the customer and HP. HP continues to provide a high-quality support offering and refer to independent surveys to validate consistent quality.

HP currently has no alliances for OLTP services. The company indicates that it doesn't have any fundamental objections to alliances, but believes that none are needed.

For OLTP services, HP believes that is has no competitors. However, HP notes that for its equipment and software, nearly everyone is a competitor. For services, there is a limited amount of competition from local providers, but the amount is not significant.

HP considers two services to be essential to providing OLTP support. The first is implementation assistance. This is generally oriented to helping a customer define the OLTP requirements to ensure that business needs are met. The second requirement is for fast, effective problem solving.

As indicated by HP's recent statements, the company considers support services to be essential to HP's business and can be expected to continue the development of service offerings for some time.

IBM Corporation

Corporate Headquarters
Armonk, NY 10504

Company Overview

A worldwide leader in information systems and services, IBM's worldwide earnings for the year ended December 1988 were $5.8 billion. The earnings were generated from revenues of $59.7 billion.

Following a comprehensive restructuring, the company is divided into seven functional lines of business.

- Applications Systems
- Programming Systems
- Communications Systems
- Enterprise Systems
- Application Business Systems
- Personal Systems
- Technology Products

In addition to the Systems and Products groups, there are a number of corporate departments and activities that cross the responsibility lines of the operating groups. Support for On-line Transaction Processing is included as part of the corporate functions.

OLTP Support Services

IBM indicates that it has specific groups set up for OLTP support. However, a review of the overall structure indicates that there is no single group dedicated to OLTP.

There are at least two support groups that have responsibility for OLTP support, but no single group having OLTP responsibility. One of the support groups has responsibility for Availability and Technology Support and the other has responsibility for Industry Applications.

Although the exact size of the support groups was not provided, the maximum number of people to support all worldwide activities is estimated not to exceed several hundred.

A key focus of IBM is that success in OLTP is critical to the development of the company. With this focus, the primary responsibilities of the support groups could generally be described as twofold.

- The first responsibility is to be market driven, ensuring that the proper mix of products is available to meet customer needs.

- The second responsibility is to act as an internal catalyst, fostering the integration of products that will meet future OLTP needs.

IBM believes that the majority of its midrange and large systems are capable of supporting the most demanding OLTP applications. IBM's primary product for providing fault-tolerant operation is System 88.

Support for OLTP-related products is provided in a number of ways. Software updates are provided for all Program Products. Temporary fixes are also provided to resolve critical issues.

In addition to the process of updating software, IBM provides traditional services, such as 800 service, for reporting problems (hardware and software). Following the initial contact, problem escalation is guided primarily by two factors.

- The first is the judgment of the engineer regarding his or her ability to resolve the problem. Numerous levels of support are available if needed. There are few specific standards requiring an engineer to escalate a problem.
- The second guideline is the severity of the problem at the customer's site. IBM assigns severity codes to systems running at a customer site; the highest indicates that the company's primary business cannot be conducted without the systems. Outages with the highest severity code receive immediate and extensive attention. Efforts to resolve other outages focus on system restoration rather than problem resolution.

To support the life cycle of an OLTP application, IBM can provide services in each of the key areas (design, planning, etc.), but has few specific products. For the design and planning phase, IBM can provide significant expertise and can adapt a number of products to the situation, but IBM does not have specific OLTP product.

To support implementation, IBM provides a number of technical tools—such as debuggers and analytical tools—to monitor implementation progress and identify potential problems for resolution.

IBM traditionally does little in the area of operations. However, it can provide a wide range of tools to assist the user in monitoring and controlling the operational environment. In addition, IBM will provide expertise to assist in indentifying and resolving problems.

As a general guideline, IBM does not provide support for customer-developed, third-party, or locally developed software. However, IBM will now work with vendors of third-party software to identify and resolve a problem. In addition, IBM will provide information needed by software vendors to integrate their products.

Aside from the System 88, which is designed to meet the need for fault-tolerant processing, IBM has few specific hardware features designed specifically for OLTP. IBM's primary focus has been to develop redundant and alternate

processing paths that provide rapid fault bypass to meet the needs of continuous availability.

Pricing of support services falls into two general categories:

- The first is general support services, which would include standard hardware and software maintenance. These are based on standard published rates and are not bundled into other products or services.
- The second category is a contract or negotiated T&M (time and materials) basis. Services can also be provided as part of a large contract, such as systems integration.

OLTP Support Strategy

The basic strategy for IBM is oriented toward providing integrated solution opportunities. This strategy generally implies providing end-to-end connectivity (physical and functional) through a wide range of products.

Within this overall framework, there are several specific areas that are key to the overall strategy.

- Integration - Through the use of SAA, provide greater integration between the range of products and services.
- Workstations - Provide increasing focus on the use of workstations for program development.
- Distributed Data - Distribute information to locations where it is most frequently needed, providing logical and physical paths for data movement to meet enterprise needs.
- Ease of Use - Provide solutions that can be easily used by the owner/user of the data.

To achieve the overall strategy, IBM has positioned its OLTP support services around two key considerations. The first is the overall strength of the family of products. The second is a focus on a customer's overall business needs.

IBM believes that it has exceptional strength in products such as IMS, the DBMS systems, the linkage between the PS/2 and the AS400, and the wide range of products that permit the access and use of data.

Key to the overall strategy is working to assist customers in understanding their own processing requirements. IBM's support staff will work to identify the most cost-effective solution to meet current needs and provide a foundation to meet future needs.

IBM identified three organizations that it believes are existing or possible competitors: Tandem, Teradata, and DEC.

IBM views Tandem as a strong competitor in the nonstop market and acknowledges Tandem's presence and overall quality. Tandem's chief weakness is seen as a comparatively narrow market.

Teradata is seen as a competitor because of its data warehousing capability. IBM sees Teradata as competing in an increasingly distributed marketplace. Teradata's weakness is its lack of a full line of products.

DEC is seen as a possible future competitor. Acknowledging DEC's market presence, IBM believes that products such as CICS are stronger than DEC's comparable products. DEC's overall capability is seen as good, but its ability to successfully execute in a customer-oriented marketplace is questioned.

IBM has established strategic alliances in a number of areas. As an example, it has established alliances to increase its presence in Europe (Fiat and Ericsson), to expand its influence in the Far East (NTT and Mitsubishi Bank), and to broaden its service line in the U.S. (Sears, Next, and Supercomputer Systems).

In addition, IBM has established relationships with a number of software providers as part of its Cooperative Software Program and has begun to consider its relationships with other vendors more favorably.

IBM considers the complete analysis of user needs and requirements—with a focus on long-term needs—as the most important success factor. In addition, IBM believes that an organization must be able to provide broad solution support.

IBM is seen by users as having extensive strengths and a number of weaknesses. Among the key strengths are the broad product line and marketing skills. Among the key weaknesses is an excessively long time to resolve software problems and a perceived arrogance.

In addition, although improvements can be noted, users have been generally dissatisfied with IBM's communications product offerings. This dissatisfaction has traditionally applied to both hardware and software products.

Overall, IBM considers OLTP to be key to the future of successful organizations and believes it has the products and services to meet current and future needs.

International Computers Limited

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Company Overview

Since 1984, ICL has been part of the STC group, and represents all STC's information systems and services. STC's other activities are communications systems, components/distribution, and defense.

In the year to mid-1988, STC's worldwide revenue was £2,093 million ($3,770 million), of which ICL represented £1,274 million ($2,290 million).

ICL is the UK's largest computer hardware manufacturer. Like many other European hardware manufacturers, ICL realizes that 1992 and the single European market will mean that it has to increase its European coverage. It has set up a European Strategy Board and has stated a policy to:

- Acquire relevant interest in smaller European IT companies
- Set up alliances with continental European companies
- Cooperate with major European players, whether European owned or not

It has already been on the acquisition trail (Datachecker, Computer Consoles, Northern Telecomm's data systems, and U.K. telecommunications businesses), and there will be more to follow.

It plans to be one of the leading European companies in each of its chosen key markets by the early 1990s.

OLTP Support Services

The hardware that ICL uses for OLTP services is any of its range running on its VME operating system; notable are the 2900 series and the Series 39.

VME was designed in the early 1970s as a specific operating system for on-line systems. It was launched in 1974 and is tightly coupled with ICL hardware to give a complete OLTP package.

To design and plan OLTP applications, ICL has its own 4GLs. QUICKBUILD is the main tool, with subelements such as its on-line language QUERY MASTER, QUICKBUILD PATHWAY, its high-level user guide, and IDMX, its data base. ICL believes that its Data Dictionary Service is a world leader.

These tools allow ICL or its clients to build new applications very easily and integrate them into its Transactional Processing Management Service (TPMS). This

is a layered service controlled by a virtual machine module (TP Monitor). This module allows one, or more different on-line applications to be run within it.

Such OLTP systems are supported on-line via special software known as SAM (Support and Maintenance). This software regularly monitors the performance of the application and is linked directly to the nearest ICL support center. If problems are identified by SAM, it will automatically transmit details to the support center, where a finger-print is kept of the application and its history. Information from the central knowledge base is automatically extracted and transmited to either the customer site, or the relevant engineer site.

ICL engineers can also access SAM and down-load information on-site for repair and maintenance.

If there are still problems with an application, and the customer cannot resolve them himself (first level of service), he can contact his ICL sales division for the second level of service. The second level of service involves calling on one, or more internal ICL experts including:

- Business consultants
- Product consultants
- Software service centers

If there are still problems then he can go to the third and fourth level of service, which is delivered by the relevant business division that services his hardware and industry requirements.

Support is generally priced as standard packages. There are:

- START UP for initializing an on-line service
- SUPER 39 for on-going support, normally on a yearly renewable contract

OLTP Support Strategy

ICL provides a total support service. It is customized to meet the customers needs and allows the customer to select the elements that are desired.

Support is one of the three key elements in providing the customer with a total solution. The other two are hardware and software.

Because of the flexibility of ICL's TPMS service, the company does not mind who develops the application. Many customers have some elements provided by a third party. These parts can be simply integrated into the overall TPMS and run under ICL's Transaction Processing Monitor.

ICL provides a total support service, in general using its own resources. The one existing exception involves an agreement with RTI to supply INGRESS on VME. INGRESS is integrated into QUICKBUILD.

ICL's strength appears to be the duration of time (15 years) that it has been supplying on-line systems on its VME operating system. The company, therefore,

has had a lot of experience and has managed to develop its design and development tools so that they are very user-friendly. In particular, ICL stressed that its 4GL tools made it superior to IBM and Digital. It has also developed its remote support services to a high level via SAM.

Its weaknesses would seem to be those of most European hardware manufacturers, that of having a concentrated geographic user base, rather than pan-European coverage.

McCormack & Dodge Corporation

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Company Overview

Formed in 1969 and acquired by Dun & Bradstreet in 1983, McCormack & Dodge develops, markets, and supports software products for financial, human resources, and manufacturing resource planning applications. The company also offers software tools for application development, micro-to-mainframe links, and report writing.

McCormack & Dodge's fiscal 1987 revenue reached an estimated $151 million, a 24% increase over estimated fiscal 1986 revenue of $122 million. The company currently has approximately 1,800 employees.

McCormack & Dodge is organized into a number of distinct business units.

- **Financial Business Systems Unit** - markets and supports the company's Millennium products to the financial business community.
- **Human Resources Business Unit** - markets and supports the Millennium human resource product line.
- **Application Tools Business Unit** - markets and supports Millennium application tools and its micro-to-mainframe link.
- **Distributed Systems Business Unit** - markets and supports the PLUS line of financial/accounting products for DEC VAX and IBM System 36 and 38 computers and PCMinLink.
- **Manufacturing Systems Business Unit** - markets and supports the PIOS and C/PIOS manufacturing and control systems.

OLTP Support Services

McCormack does not have a specific group oriented to providing OLTP services. While its products are clearly geared to providing on-line processing services, the company does not have a specific focus on OLTP.

The company's overall focus is on specific products and business sectors as indicated in the company overview. Within this overall framework, the company provides a number of levels of software product support, but does not provide support that is unique to OLTP.

For all of its products, McCormack provides periodic updates to enhance the product and make necessary corrections. During the first year after product purchase, the updates and other support is provided as part of the purchase price.

Support for the first year is structured around a concept of "support units." Included in the product purchase price, the customer receives a number of units of support that can be allocated as payment for a number of purposes. The units can be used to pay for programmers to add features. They can be used to send staff to training classes, or they can be used for service calls to M&D's hotline.

Following the first year, the customer can continue to receive product updates and hotline support by paying an annual fee of between 13.5% and 15% of the purchase price. There is no specific support or support pricing related to OLTP.

As a seller of packaged software solutions, the company provides no support for the application design or planning phases of the system life cycle. McCormack provides onsite implementation support and supports operational requirements, but the company does not become directly involved in operational activities.

The company provides no support to third-party, customer-developed, or locally-developed software. It markets the Millenium product line for customers to develop their own applications and does not support the products of other companies.

McCormack believes that a customer is in the best position to determine its needs and requirements and that most of the application requirements can be met with M&D's Millennnium product.

OLTP Support Strategy

The company has no specific strategy for OLTP support services. It will continue to enhance existing products and develop new products to meet customer needs.

The company believes that its products provide extensive on-line transaction processing capability. It has not identified a need to place any greater emphasis on either "non-stop" or "higher availability" operations.

McCormack & Dodge identifies Management Science America as its chief competitor. Computer Associates International, Cullinet, and Data Design Associates are also competitors, but to a lesser degree. The company does not consider itself in the OLTP business and therefore there are no competitive considerations in this area.

McCormack & Dodge is viewed as a leader in its area of expertise. The company is perceived to have strong technical expertise and to provide high quality products. Its support is reported to be generally good. The company will work with a customer to meet a customers needs.

When considering the unique needs of OLTP, McCormack is not seen as a strong competitor. The company is generally perceived to be narrowly focused on its own products and not able to fully exploit the OLTP market.

McCormack has relationships with most hardware manufacturers including DEC and IBM. They have also formed an alliance with Andersen Consulting for the Millennium product in the manufacturing sector. McCormack indicates that it will work with any vendor to meet the needs of a customer.

Siemens AG

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Company Overview

Siemens is the largest European information systems and services vendor.

As of year-end September 1988, the total group revenue was $34 billion. Of this worldwide revenue, some $7 billion came from information systems and services, of which $6 billion was generated within Europe.

Approximate breakdown of worldwide sales is as follows:

Components	4%
Energy & Automation	20%
Communications & Info Systems	6%
Medical	9%
Telecommunications Networks	17%
Power Plants	22%
Lamps, etc.	6%

Approximately 52% of Siemens' worldwide revenues are generated from the West German market.

With this strong dominance of its domestic, German market, Siemens has its eye on becoming more European. One of the stimuli is the European 1992 initiative.

Considerable press coverage has been given to the joint bid by Siemens and GEC of the U.K. for Plessey, also based in the U.K. Both Siemens and GEC are heavily biased towards their home markets and both need to develop new alliances with the single European market approaching.

OLTP Support Service

Siemens does not sell hardware specifically for OLTP. It sells a full range of computers, from PCs to mainframes. Siemens considers that its specific hardware design features are fast memories and quick access times.

The BS2000 is the operating system for mainframes, and Sinix, the operating system for smaller systems, would be used for OLTP. Siemens does not have a specific group to provide or market OLTP services, nor does it have any specific design features, beyond distributed processing.

OLTP services are provided by Siemens' field engineers or in-house specialists. The company provides software updates through its own software support organization, while its remote support structure consists of field engineers.

Call handling and escalation procedures are set up to provide immediate help. Backups are in place and there is a system of "24 hour alert."

The customer has no role to play in OLTP support whatsoever. Siemens has developed its own OLTP software tools, DOMINO and TOM. These allow the end user to develop and support his application via Siemens field engineers.

Siemens adopts agreements which cover level of service, accountability, etc. of each party.

For customer-developed software, Siemens' system engineers and in-house specialists will provide support. If the application is third-party software, Siemens provides the third-party with the requisite information; it is currently discussing the possibility of a third-party agreement with SAP. If the software is locally developed, it would be the Siemens systems engineers who would provide the support service.

OLTP Support Strategy

Siemens' reason for offering OLTP (support services) was that the demand exists and that anyone offering real-time systems cannot afford not to offer OLTP. The company has positioned itself as a large company with a high-quality product that can accommodate all requirements, including software tools.

OLTP in Siemens forms part of the services offered with Siemens BS 2000 operating system (mainframe) and SINIX (a Siemens UNIX type package). The company offers two specific OLTP-type products, data bases and transaction monitors, but only with BS2000 and Sinix. However, they should not be viewed as separate OLTP products, nor is their support service special to just OLTP.

Support services are for the most part (80%) negotiated on a per-contract basis.

The company does not have any strategic alliances apart from the one currently under negotiation with SAP.

Siemens sees that its major competitor is IBM, followed by Tandem. The company believes that in OLTP the two key issues are the software development tools and a complete product/total solution.

Stratus Computer, Inc.

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Company Overview

Stratus Computer, Inc. manufactures fault-tolerant processors for the OLTP market. The company's high-performance transaction processing systems are used worldwide by major banks, brokerage houses, stock exchanges, financial services companies, manufacturers, communications firms, governments, and other commercial and service industries.

After growing steadily since its founding in 1980, Stratus generated $184.2 million in revenue and $19.4 million in profit in 1987.

During 1987, Stratus introduced Models 50 and 70 of its XA2000 Series. The company expects the lower price level of these models to expand the OLTP market for application solutions in distributed processing environments, including branch banks, retail stores, distribution warehouses, and other transaction-intensive environments.

Also during 1987, Stratus introduced two high-end additions to its line of fault-tolerant processors. The XA2000 Models 150 and 160 boost the main memory capacity of the line by a third, and processing power by 40%.

In July 1988, Stratus made a move into the Pick operating environment with the creation of a new Pick division in Laguna Hills (CA). Stratus asserts that because Pick applications are often critical to the operation of the customer's business, they require the same OLTP functionality that Stratus provides.

Stratus utilizes a direct sales force and two powerful alternate distribution channels, IBM and Olivetti & C., S.p.A., with which it has OEM agreements. In 1987, the company expanded its direct sales force by opening sales offices in France and Japan. Stratus also has sales offices in the United Kingdom, Federal Republic of Germany, Hong Kong, Belgium, and Holland. Stratus also announced a new distributor in Korea in 1987 and strengthened relationships with distributors worldwide.

OLTP Support

Stratus' service organization includes its Customer Assistance Center (CAC) from which replacement parts are sent out, and problems with software and hardware are diagnosed and solved. Approximately 70 staff members support OLTP system

users from the CAC. Another 35 systems engineers, located in the company's sales offices, are also part of the service organization.

Stratus also has a small Performance and Benchmarking Group, which conducts design review, performance, and benchmarking tests (industry standard tests used to compare various manufacturers' equipment). In addition, Stratus provides support to its own people through a Sales Support Group.

Stratus provides shared-memory, fault-tolerant, expandable modular systems with support communications built into the systems—the company's entire product line serves the OLTP market. Specific design features utilized for OLTP support include customer-replaceable boards, remote service network cards, and multiple CPUs, disk drives, and memories. When a part fails, the computer signals the CAC, which sends the new part by overnight mail. Stratus' proprietary operating system, VOS, allocates resources and switches input/output functions when a failure occurs.

Remote support includes the capability for support personnel to essentially become users of the system in order to examine the problem the customer is experiencing. These support personnel become users by dialing into the system via modem. In a case three years ago, support personnel were even able to fix a bug in the firmware through remote support.

Call and escalation procedures are as follows: When a call comes into the CAC, the customer service representative attempts to talk the user through the problem. If necessary, the service representative accesses the user's file utilizing the company's remote service network. In rare cases, support personnel goes on-site. Stratus explained that the critical nature of OLTP requires them to provide immediate and effective support.

Stratus customers' involvement in the support process entails installing telephone lines for remote access to the system and replacing circuit boards, if the customer desires, for a reduced maintenance fee.

Stratus does not get involved in the design, planning, implementation, or operation of custom OLTP applications, although the company will install a new software release and assist customers with operational/administrative aspects of getting a system up and running.

Stratus typically does not support third-party software, although the arrangements vary. For example, Stratus recently agreed to sell and support IBM SNA.

For both hardware and software maintenance, Stratus offers maintenance contracts as well as the option to obtain services on a time and materials basis.

OLTP Support Strategy

Stratus described its OLTP support strategy to be the strategy of the company, since the company's entire product line serves the OLTP market. The strategy is to provide the best OLTP products and services available.

Although Stratus is a hardware manufacturer, the company considers OLTP systems to be much more than hardware. Critical to performance, the VOS operating system used in Stratus' OLTP systems was designed from the ground up specifically for OLTP. Another part of the company's strategy is to make remote support part of the manufacturing process.

One of Stratus' strengths lies in its strategic alliances and marketing agreements. In addition to its alliances with IBM and Olivetti & C., S.p.A., Stratus also has marketing agreements with approximately 150 software vendors.

Stratus was rated as having the most loyal users by the Cowen/Datamation user survey (results reported in March 1988). Customers reported that they had gained control over their site, because they no longer had to rely on field engineers' schedules. Stratus makes a minimum of on-site calls, often utilizing third-party vendors for support, and passes its savings on to its customers. In order to eliminate potential labor union problems, all Stratus parts weigh less than 50 pounds, and replacement requires no tools.

One weakness is that although Stratus says the IBM System/88 is identical to the machines they market, with the exception of some minor changes IBM made to the operating system and the peripherals it uses, IBM perceives a distinct difference in their version of the Stratus product, namely in the service and support provided.

Stratus considers its competitors to be Tandem, DEC, and IBM (for mainframe equipment not manufactured by Stratus).

Tandem Computers, Inc.

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Company Overview

Tandem Computers manufactures and supports computer systems and networks for the OLTP market. Tandem produces a family of computer systems consisting of the NonStop VLX, NonStop TXP, NonStop II, NonStop EXT10, NonStop EXT25, and NonStop CLX systems. They feature the company's proprietary hardware and software architecture.

Tandem's systems were the first to use multiple independent processors in a standard configuration for the commercial marketplace. The architectural approach combines multiple parallel, but not redundant, processors and non-shared memory.

The architecture includes a message-based operating system capable of managing a multiprocessing, distributed environment. Tandem's GUARDIAN 90 operating system is designed to keep applications running through any single failure. For example, if a processor fails, work is automatically redirected to other processors in the system.

In addition to its proprietary operating system, Tandem provides networking and communications software, a relational data base management system (NonStop SQL), and information management software products. Additional hardware that Tandem provides includes storage products, workstations and terminals, and communications products. Tandem's work in the area of communications includes developing interfaces for its computers to link to AT&T's 5ESS ISDN switch.

In March 1988, Tandem acquired Ungermann-Bass for $260 million. The acquisition provided Tandem with needed local area network offerings. Atalla, another wholly owned subsidiary, provides products for security applications. And, Tandem Telecommunications Systems develops network services software for the telecommunications industry.

Tandem's revenue for fiscal year end September, 1988, reached $1.3 billion, representing 26% growth over fiscal 1987. Profit of $94 million represented a 10% decrease from the fiscal 1987 level.

The company's products are used worldwide in a number of governmental agencies and in many industries, including banking, financial services, manufacturing, communications, wholesale and retail distribution, transportation, medical services, printing and pubishing, computer services, and utilities.

OLTP Support

Tandem provides support for all of its own hardware and software products through its Customer Service Group. (The company would not disclose the size of this group.) When a customer has a support problem, he may call a local or regional office or one of Tandem's National Support Centers located in Canada, Denmark, France, Japan, Sweden, the United Kingdom, the United States, and West Germany.

An integral part of support is in the design of Tandem's systems. Tandem's components work together so that if a processor fails, its workload is distributed over the remaining components and the OLTP application still runs.

In addition to its hardware reliability, Tandem also builds remote support capabilities into its systems. Utilizing these capabilities, Tandem personnel can often find problems before they become apparent to customers. Instead of a regularly scheduled preventive maintenance visit where the sharp field engineer (FE) would catch something about to fail, software modules running constantly within the system catch potential problems. Because Tandem provides duplicates of all critical components on a board, an FE can see the problem and bring a new board to swap prior to failure.

The average time between fault and diagnosis is less that 15 minutes for remote support. For full on-site service, standard contractual response time is four hours, which includes the time to arrive, diagnose, and repair. Tandem is reportedly beating its contractual obligations by averaging on-site fixes within two hours.

Although Tandem does not develop custom software for the OLTP market nor does it develop OLTP applications, approximately 260 companies provide off-the-shelf and custom software solutions for Tandem equipment as part of the Alliance program. Software companies, value-added resellers, systems integrators and other professional services vendors comprise the Alliance program. In addition, customers who have developed application software for their own use may also join the Alliance program to license their solutions to others. Through the consulting arm of the company, Tandem recommends specific software products to meet the needs of its clients.

Tandem does not provide support for third-party software or for customer-developed software. Since Tandem does not provide application software products, the company provides no support for applications software. The company does, however, have the capability to determine remotely (from Austin, TX) exactly what hardware, systems software, or applications software is responsible for the customer's problem.

Software support for Tandem's systems and communications software is bundled into the price of the software. Hardware maintenance is available on a time and materials basis, or customers can purchase maintenance contracts. In addition, customers can choose to assume responsibility for part of the maintenance

themselves. Any consulting activities are contracted for and generally involve a bidding process.

Tandem's ENCOMPASS distributed data base management system was the precursor to NonStop SQL software. To meet the needs of customers who have developed or still want to develop applications on ENCOMPASS software, Tandem is providing a migration path from ENCOMPASS software to NonStop SQL software.

Recently, Tandem and the International Tandem Users' Group jointly announced the creation of a worldwide information network for sharing information among the company and its users.

In addition, Tandem provides benchmark testing for specific customer applications utilizing its state-of-the-art Benchmark Center in Cupertino (CA).

OLTP Support Strategy

Since Tandem is in the OLTP business exclusively, its OLTP support strategy is tied closely to the strategy of the company. Tandem's strategy is to provide the best OLTP products available in order to be the leader in the OLTP market.

Part of Tandem's strategy lies in its system architecture. The architecture allows expansion of the system to 16 processors at a single customer site, or as many as 224 processors using Tandem's FOX fiber-optic extension. This growth capability allows the user to expand a system in transaction processing power and capacity without sacrificing the initial investment in hardware and software.

Tandem's systems can also be deployed in a geographically distributed network of up to 4,080 processors—without rewriting application software—using Tandem's EXPAND software.

In addition to the 260 companies that are part of Tandem's Alliance program, Tandem also has an agreement with Diebold for hardware support. Tandem was quick to point out, however, that it is not in the business of subcontracting for support.

Tandem identified its competitors as IBM, DEC, and Stratus. Tandem believes that its understanding of the OLTP market and its innovative solutions, plus its powerful systems, data base products, and networks will help the company maintain its leadership position in the OLTP market.

Unisys Europe-Africa Ltd.

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Company Overview

Unisys was created in 1986 by the merger of Sperry Corp. and Burroughs Corp.

By 1987 it had global revenue of $9,713 million, of which $8,742 million was reported as being for IS and $2,273 million from Europe. This places Unisys as the eighth largest supplier of IS services in Europe in 1987.

Unisys' stated strategy is to provide "total solutions."

The company is looking to provide these solutions through systems integration and mass produced turnkey/VARs solutions. In 1988 the company bought Timeplex Inc., a manufacturer of high-capacity network equipment for $314 million and, in late 1988, the office workstation manufacturer, Convergent Technologies, for $350 million. Further acquisitions are being sought.

Unisys sees itself, through its two original parent organizations, as a traditional vendor of communication services. In recent years, network services have been added, leading Unisys to consider itself as an OLTP vendor.

OLTP Support Services

Today, OLTP is an integral part of Unisys' offerings throughout its hardware product line. Typical Unisys OLTP hardware includes:

- A Series
- 2200 Series
- Series 80
- V Series
- Unix machines

Because OLTP is viewed as an integral part of Unisys, the company does not have a specific group handling it. However, it does ensure that virtually all of its support staff understand what is meant by OLTP.

The company is divided into four vertical markets:

- Finance
- Industry
- Government
- Distribution

In each of these, OLTP is part of Unisys' market offering.

To assist the company in providing total solutions to the market, the "Complex Systems Organisation" has recently been created. This resource provides systems integration services and can be brought in by any one of the four vertical marketing arms as an additional resource.

In addition, Unisys has the "Open Systems Skills Centre." This cross-industry service has been developed to market the benefits of Unisys' solutions and to assist clients in understanding how and why they should move from a competitor to Unisys.

Unisys provides a range of support service, "depending on what the client wants."

Its support services come under the marketing banner "A La Carte." It is basically a layered service offering allowing the client to decide what level of service he wants. It consists of standard packages of service at standard prices.

Unisys can offer a total OLTP support service, with full remote dial-in services. However in practice, the client specifies the support, help-line, and call-escalation procedures he wants Unisys to provide and what he will cover himself. Unisys then accommodates whatever the client wants.

The exception to this role occurs when the client wants Unisys to operate the OLTP application as a bureau service. Unisys has made the decision not to get involved in high-volume/low-value OLTP bureau services and in this case would place the client in contact with one of a number of large independent bureau services that Unisys works alongside.

OLTP Support Strategy

Unisys' strategy is to give the client what he wants and to fit into the existing structure of the client in terms of providing the right level of service and support.

Unisys sees OLTP as one of its key established strategic offerings. The entire company is, therefore, geared up to sell and support OLTP services. As mentioned above, the one area Unisys does not provide complete support service involves running the application as a bureau service.

Unisys also works closely with large independent professional service vendors. Again, it takes a very flexible approach to tendering (allowing the independent vendor to tender and run the project if that is needed to secure the business).

The company's two key elements to its OLTP offering are:

- Giving the client what he wants
- Providing the relevant professional services to make Unisys' solution work (either through Unisys' Complex Systems service, or through third-party systems-integration vendors)

Unisys' strength in the OTLP market seems to be its flexibility in providing the service that the client wants, rather than what Unisys thinks it should offer.

Added to this, Unisys can and does appear to offer an on-line service that works. It provides very acceptable levels of up-time and minimum recovery time to its clients. Both are critical factors in any OLTP service.

Thirdly, it has very friendly user interfaces to allow clients to modify and create on-line programs.